

5.0 Waterbody Improvement Projects

New York City is served primarily by a combined sewer system. Approximately 70 percent of the City is comprised of combined sewers totaling 4,800 miles within the five boroughs. The sewer system drains some 200,000 acres and serves a population of approximately 8 million New Yorkers. Approximately 450 outfalls are permitted to discharge during wet-weather through CSOs to the receiving waters of the New York Harbor. These discharges result in localized water-quality problems such as periodically high levels of coliform bacteria, nuisance levels of floatables, depressed dissolved oxygen, and, in some cases, sediment mounds and unpleasant odors.

The City of New York is committed to its role as an environmental steward of the New York Harbor and began addressing the issue of CSO discharges in the 1950's. To date, NYCDEP has spent or committed over \$2.1 billion in its city wide CSO abatement program. As a result of this and other ongoing programs, water quality has improved dramatically over the past 30 years (NYCDEP Harbor Survey Annual Reports). Implementation of many of these solutions within the current NYCDEP 10-year capital plan will continue that trend as NYCDEP continues to address CSO-related water quality issues through its City-Wide CSO Floatables program, pump station and collection system improvements, and the ongoing analysis and implementation of CSO abatement solutions. The following sections present the history of NYCDEP CSO abatement and describe the current and ongoing programs in detail.

5.1 CSO PROGRAMS 1950 TO 1992

Early CSO assessment programs began in the 1950s and culminated with the 1972 construction of the Spring Creek Auxiliary Water Pollution Control Plant, a 12-million gallon CSO retention tank, constructed on a tributary to Jamaica Bay. This project was one of the first such facilities constructed in the United States. Shortly thereafter, New York City was designated by USEPA to conduct an Area-Wide Wastewater Management Plan authorized by Section 208 of the then recently enacted CWA. This plan was completed in 1979 and, in part, identified a number of urban tributary waterways throughout the City in need of CSO abatement. The City's fiscal crisis developed around that time, and resources were diverted from CSO abatement to wastewater treatment plant upgrades.

In 1983, NYCDEP re-invigorated its CSO facility-planning program in accordance with NYSDEC-issued SPDES permits for its wastewater treatment plants with a project in Flushing Bay and Creek. In 1985, a city-wide CSO Assessment was undertaken which assessed the existing CSO problem and established the framework for additional facility planning. From this program, the City was divided into eight areas, which together cover the entire harbor area. Four area-wide projects were developed (East River, Jamaica Bay, Inner Harbor and Outer Harbor) and four tributary project areas were defined (Flushing Bay, Paerdegat Basin, Newtown Creek, and the Jamaica tributaries). Detailed CSO Facility Planning Projects were conducted in each of these areas in the 1980s and early 1990s resulting in a series of detailed plans.

In 1989, NYCDEP initiated the City-Wide Floatables Study in response to a series of medical waste and floating material wash-ups and resulting bathing beach closures in New York and New Jersey in the late 1980s. This comprehensive investigation identified the primary

sources of floatable materials in metropolitan urban area waters, aside from illegal dumping, as CSO and stormwater discharges. The study also concluded that street litter in surface runoff is the origin of floatable materials in these sources. The Floatables Control Program is discussed in Section 5.4.

5.2 1992 AND 2005 CONSENT ORDERS

In 1992, NYSDEC and NYCDEP entered into the original CSO Administrative Consent Order (1992 ACO). As a goal, the 1992 ACO required NYCDEP to develop and implement a CSO abatement program to effectively address the contravention of water quality standards for coliforms, dissolved oxygen, and floatables attributable to CSOs. The 1992 ACO contained compliance schedules for the planning, design and construction of the numerous CSO projects in the eight CSO planning areas.

The Flushing Bay and Paerdegat Basin CSO Retention Tanks were included in the 1992 ACO and are now under construction. In addition, two parallel tracks were identified for CSO planning purposes. Track 1 addressed dissolved oxygen (aquatic life protection) and coliform bacteria (recreation) issues. Track 2 addressed floatables, settleable solids and other water use impairment issues. The 1992 ACO also provided for an Interim Floatables Containment Program to be implemented consisting of a booming and skimming program in confined tributaries, skimming in the open waters of the harbor, and an inventory of street catch basins where floatable materials enter the sewer systems.

In accordance with the 1992 ACO, NYCDEP continued to implement its work for CSO abatement through the facility-planning phase into the preliminary engineering phase. Work proceeded on the planning and design of eight CSO retention tanks located on confined and highly urbanized tributaries throughout the City. The CSO retention tanks at Flushing Bay and Paerdegat Basin proceeded to final design. The Interim Floatables Containment Program was fully developed and implemented. The Corona Avenue Vortex Facility pilot project for the floatables and settleable solids control was designed and implemented. The City's 130,000 catch basins were inventoried and a re-hooding program for floatables containment was implemented and substantially completed. Reconstruction and re-hooding of the remaining basins (less than 4 percent) will be completed by 2010.

For CSOs discharging to the open waters of the Inner and Outer Harbors areas, efforts were directed to the design of sewer system improvements and wastewater treatment plant modifications to increase the capture of combined sewage for processing at the plants. For the Jamaica Tributaries, efforts focused on correction of illegal connections to the sewer system and evaluation of sewer separation as control alternatives. For Coney Island Creek, attention was directed to corrections of illegal connections and other sewer system/pumping station improvements. These efforts and the combination of the preliminary engineering design phase work at six retention tank sites resulted in changes to some of the original CSO Facility Plans included in the 1992 ACO and the development of additional CSO Facility Plans in 1999. The status of CSO projects currently under design or construction as of late 2008 are presented in Table 5-1.

Table 5-1. CSO Projects under Design or Construction

Planning Area	Project	Design Completion	Construction Completion
Alley Creek	Outfall & Sewer System Improvements	Mar2002	Dec 2006
	CSO Retention Facility	Dec 2005	Dec 2009
Outer Harbor	Regulator Improvements – Fixed Orifices	Apr 2005	Jul 2008
	Regulator Improvements – Automation	Nov 2006	Jun 2010
	Port Richmond Throttling Facility	Aug 2005	Dec 2008
Inner Harbor	Regulator Improvements – Fixed Orifices	Sep 2002	Apr 2006
	Regulator Improvements – Automation	Nov 2006	Jun 2010
	In-Line Storage	Nov 2006	Aug 2010
Paerdegat Basin	Influent Channel	Mar 1997	Feb 2002
	Foundations and Substructures	Aug 2001	Feb 2009
	Structures and Equipment	Nov 2004	May 2011
Flushing Bay	CS4-1 Reroute & Construct Effluent Channel	Sep 1994	Jun 1996
	CS4-2 Relocate Ball fields	Sep 1994	Aug 1995
	CS4-3 Storage Tank	Sep 1996	Aug 2001
	CS4-4 Mechanical Structures	Feb 2000	May 2007
	CS4-5 Tide Gates	Nov 1999	Apr 2002
	CD-8 Manual Sluice Gates	May 2003	Jun 2005
Jamaica Tributaries	Meadowmere & Warnerville DWO Abatement	May 2005	Jul 2009
	Expansion of Jamaica WPCP Wet Weather Capacity	Jun 2011	Jun 2015
	Destratification Facility	Dec 2007	Nov 2010
	Laurelton & Springfield Stormwater Buildout Drainage Plan	Jan 2008	
	Regulator Automation	Nov 2006	Jun 2010
Coney Island Creek	Avenue V Pumping Station Upgrade	Jan 2005	Apr 2011
	Avenue V Force Main	Sep 2006	Jun 2012
Newtown Creek	Aeration Zone I	Dec 2004	Dec 2008
	Aeration Zone II	Jun 2010	Jun 2014
	Relief Sewer/Regulator Modification	Jun 2009	Jun 2014
	Throttling Facility	Jun 2008	Dec 2012
	CSO Storage Facility	Nov 2014	Dec 2022
Westchester Creek	Phase 1 (Influent Sewers)	Jun 2010	Jun 2015
	CSO Storage Facility		Dec 2022
Bronx River	Floatables Control	Jul 2008	Jun 2012
Hutchinson River	Phase I of Storage Facility	Jun 2010	Jun 2015
	Future Phases		Dec 2023
Jamaica Bay	Spring Creek AWPCP Upgrade	Feb 2002	Apr 2007
	26th Ward Drainage Area Sewer Cleaning & Evaluation	Jun 2007	Jun 2010
	Hendrix Creek Dredging	Jun 2008	Dec 2011
	26th Ward Wet Weather Expansion	Jun 2010	Dec 2015

NYSDEC and NYCDEP negotiated the 2005 CSO Consent Order that was signed January 2005 and supersedes the 1992 Order and its 1996 Modifications. The intent of the 2005 CSO Consent Order is to bring all CSO-related matters into compliance with the provisions of the Clean Water Act and Environmental Conservation Law. The 2005 Order contains requirements to evaluate and implement CSO abatement strategies on an enforceable timetable for the 18 waterbodies and, ultimately, for City-wide long term CSO control in accordance with USEPA CSO Control Policy. NYCDEP and NYSDEC also entered into a separate Memorandum of Understanding (MOU) to facilitate water quality standards review in accordance with CSO Control Policy. The 2005 Consent Order was modified in 2008.

5.3 BEST MANAGEMENT PRACTICES (BMP)

The SPDES permits for all 14 WPCP in New York City require the NYCDEP to report annually on the progress of 14 BMPs related to CSOs. The BMPs are equivalent to the NMCs required under the USEPA National Combined Sewer Overflow policy, which were developed by the USEPA to represent best management practices that would serve as technology based CSO controls. They were intended to be “determined on a best professional judgment basis by the NPDES permitting authority” and to be best available technology based controls that could be implemented within two years by permittees. USEPA developed two guidance manuals that embodied the underlying intent of the NMCs for permit writers and municipalities, offering suggested language for SPDES permits and programmatic controls that may accomplish the goals of the NMCs (USEPA 1995a, 1995b).

A list of BMPs excerpted directly from the most recent SPDES permits follows, along with brief summaries of each BMP and their respective relationships to the federal NMCs. In general, the BMPs address operation and maintenance procedures, maximum use of existing systems and facilities, and related planning efforts to maximize capture of CSO and reduce contaminants in the combined sewer system, thereby reducing water quality impacts. Through the CSO BMP Annual Reports, which were initiated in 2004 for the reporting year 2003, NYCDEP provides brief descriptions of the city-wide programs and any notable WPCP drainage area specific projects that address each BMP (NYCDEP,2008, NYCDEP, 2009).

5.3.1 CSO Maintenance and Inspection Program

This BMP addresses NMC 1 (Proper Operations and Maintenance of Combined Sewer Systems and Combined Sewer Overflow Outfalls) and NMC 9 (Monitoring to Characterize CSO Impacts and the Efficacy of CSO Controls). Through regularly scheduled inspection of the CSOs and the performance of required repair, cleaning, and maintenance, dry weather overflows and leakage can be prevented and maximization of flow to the WPCP can be ensured. Specific components of this BMP include:

- Inspection and maintenance of CSO tide gates;
- Telemetering of regulators;
- Reporting of regulator telemetry results;
- Recording and reporting of rain events that cause dry weather overflows; and
- NYSDEC review of inspection program reports.

NYCDEP reports on the status of the City-wide program components and highlights specific maintenance projects, such as the Enhanced Beach Protection Program, where additional inspections of infrastructure in proximity to sensitive beach areas was performed. Activities related to CSO Maintenance and Inspection that occurred during CY 2007 in the Alley Creek and Little Neck Bay sewershed included clearing blockages from TI-007 and TI-025, tide gate cleaning and lubrication, and chloride runs conducted to determine tide gate performance for Tallman Island. The chloride data indicated a slight increase in inflow volume as compared to CY2006. One CSO alarm, discovered through the CSO telemetry system, occurred in the sewershed in February of CY2007 at TI-009, the Douglaston Bay Pump Station bypass. Melting snow caused the bypass. It was able to be reduced by NYCDEP personnel responding to the alarm. The bypass was reported to NYSDEC.

5.3.2 Maximum Use of Collection System for Storage

This BMP addresses NMC 2 (Maximum Use of the Collection System for Storage) and requires the performance of cleaning and flushing to remove and prevent solids deposition within the collection system as well as an evaluation of hydraulic capacity so that regulators and weirs can be adjusted to maximize the use of system capacity for CSO storage and thereby reduce the amount of overflow. NYCDEP provides general information describing the status of City-wide SCADA, regulators, tide gates, interceptors, and collection system cleaning in the BMP Annual Report.

During 2007, in the Tallman Island collection system, 4,750 ft of the Flushing North Interceptor was cleaned (160 yd³ removed) and 1,807 ft of the Flushing Kissena Corridor Branch Interceptor was TV inspected and cleaned (60 yd³ removed).

5.3.3 Maximize Flow to WPCP

This BMP addresses NMC 4 (Maximizing Flow to the Publicly Owned Treatment Works) and reiterates the WPCP operating targets established by the SPDES permits with regard to the ability of the WPCP to receive and treat minimum flows during wet weather. The collection systems are required to deliver and the WPCPs are required to accept the following flows for the associated levels of treatment:

- Receipt of flow through the headworks of the WPCP: 2xDDWF;
- Primary treatment capacity: 2xDDWF; and
- Secondary treatment capacity: 1.5xDDWF.

The 2008 Modified Consent Order added the following to the Order: “The Tallman Island WPCP and associated sewer system are capable of delivering, accepting and treating influent at or above twice the plant’s design flow during any storm event,” with milestones including construction completion by July 2015. During 2007, the Tallman Island WPCP attained a flow rate of 160 MGD (2xDDWF) for a total of five hours. This project was added to the CSO Order due to recent hydraulic analyses and sewer system modeling projects that have indicated that additional interceptor capacity and modifications to a few regulators are required to improve the ability of the interceptors to deliver 160 MGD on a sustained basis. NYCDEP completed facility planning activities in 2005. In 2004 and 2005, NYCDEP developed plans for and designed modifications to Regulator TI-R09 that could allow it to deliver more wet-weather

flow to the WPCP. The construction work for this action was completed in mid-2006, inclusive of a SCADA project to monitor dry weather flow. A contract for the design of additional collection system conveyance capacity (interceptor capacity) was registered in 2007. Design work has begun and is expected to be complete in late 2009. The Tallman Island Wet Weather Operating Plan (WWOP) is a draft currently under review by NYSDEC. (See Appendix A)

The BMP also refers to the establishment of collection system control points in the system's Wet Weather Operating Plan as required in BMP 4, and requires the creation of a capital compliance schedule within six months of the NYSDEC approval of the Wet Weather Operating Plan should any physical limitations in flow delivery be detected.

In addition to describing WPCP upgrades and efforts underway to ensure appropriate flows to all 14 WPCPs, the BMP Annual Report provides analysis of the largest ten storms of the year and WPCP flow results for each of these storms. This analysis provides an indication of how much flow the WPCPs take during periods with sufficient rainfall that flows should attain twice design dry-weather flow at the WPCP. For the Tallman Island WPCP, wet-weather inflows during the top-ten storms have generally increased or remained relatively steady since 2005, as described in NYCDEP's CSO BMP Annual Report for calendar years 2005 to 2008 (NYCDEP, 2009).

5.3.4 Wet Weather Operating Plan

In order to maximize treatment during wet weather events, WWOPs are required for each WPCP drainage area. Each WWOP should be written in accordance with the NYSDEC publication entitled *Wet Weather Operations and Wet Weather Operating Plan Development for Wastewater Treatment Plants*, and should contain the following components:

- Unit process operating procedures;
- CSO retention/treatment facility operating procedures, if relevant for that drainage area; and
- Process control procedures and set points to maintain the stability and efficiency of BNR processes, if required.

This BMP addresses NMC 1 (Proper Operations and Maintenance of Combined Sewer Systems and Combined Sewer Overflow Outfalls) and NMC 4 (Maximizing Flow to the Publicly Owned Treatment Works). The NYCDEP provides a schedule of plan submittal dates as part of the BMP Annual Report. The WWOP required for the Alley Creek CSO Tank was originally submitted during 2007 as part of the Tallman Island WPCP WWOP along with the Flushing Tank WWOP. The WWOP currently under review by NYSDEC, is included with this report as Appendix A.

5.3.5 Prohibition of Dry Weather Overflow

This BMP addresses NMC 5 (Elimination of CSOs during Dry Weather) and NMC 9 (Monitoring to Characterize CSO Impacts and the Efficacy of CSO Controls) and requires that any dry weather flow event be promptly abated and reported to NYSDEC within 24 hours. A written report must follow within 14 days and contain information per SPDES permit

requirements. The status of the shoreline survey, the Dry Weather Discharge Investigation report, and a summary of the total bypasses from the treatment and collection system are provided in the BMP Annual Report.

As presented in the 2007 CSO BMP Annual Report, the 24th Avenue Pump Station bypassed flow for 0.25 hrs discharging 0.008 MG. The cause was 3A-Electrical Equipment Failure of distribution equipment. In addition, TI Regulator-09 bypassed flow for 1.5 hours discharging 0.190 MG. The cause was blocking in the branch interceptor from melting snow and is referred to as the Douglaston Bay PS bypass event.

5.3.6 Industrial Pretreatment

This BMP addresses three NMCs: NMC 3 (Review and Modification of Pretreatment Requirements to Determine Whether Nondomestic Sources are Contributing to CSO Impacts); NMC 7 (Pollution Prevention Programs to Reduce Contaminants in CSOs); and NMC 9 (Monitoring to Characterize CSO Impacts and the Efficacy of CSO Controls). By regulating the discharges of toxic pollutants from unregulated, relocated, or new SIUs tributary to CSOs, this BMP addresses the maximization of persistent toxics treatment from industrial sources upstream of CSOs. Specific components of this BMP include:

- Consideration of CSOs in the calculation of local limits for indirect discharges of toxic pollutants;
- Scheduled discharge during conditions of non-CSO, if appropriate for batch discharges of industrial wastewater;
- Analysis of system capacity to maximize delivery of industrial wastewater to the WPCP, especially for continuous discharges;
- Exclusion of non-contact cooling water from the combined sewer system and permitting of direct discharges of cooling water; and
- Prioritization of industrial waste containing toxic pollutants for capture and treatment by the WPCP over residential/commercial service areas.

The BMP Annual Report addresses the components of the industrial pretreatment BMP through a description of the City-wide program. The program has been successful, especially in the reduction of metals being discharged by industrial users of the municipal sewer system. Recent improvements to the Industrial Pretreatment Program have included a requirement in new and renewal permits that significant industrial users hold their process wastewater and non-contact cooling water to the maximum extent practicable during heavy rain events. It is noted that for all WPCP service areas in New York City, the industrial flow contributions to the plant flows (including Tallman Island) are less than one percent.

5.3.7 Control of Floatable and Settleable Solids

This BMP addresses NMC 6 (Control of Solid and Floatable Material in CSOs), NMC 7 (Pollution Prevention Programs to Reduce Contaminants in CSOs), and NMC 9 (Monitoring to Characterize CSO Impacts and the Efficacy of CSO Controls) by requiring the implementation

of four practices to eliminate or minimize the discharge of floating solids, oil and grease, or solids of sewage origin which cause deposition in receiving waters, i.e.:

- **Catch Basin Repair and Maintenance:** This practice includes inspection and maintenance scheduled to ensure proper operation of basins;
- **Catch Basin Retrofitting:** By upgrading basins with obsolete designs to contemporary designs with appropriate street litter capture capability. This program is intended to increase the control of floatable and settleable solids City-wide.
- **Booming, Skimming and Netting:** This practice establishes the implementation of floatables containment systems within the receiving waterbody associated with applicable CSO outfalls. Requirements for system inspection, service, and maintenance are established, as well; and
- **Institutional, Regulatory, and Public Education -** A one-time report must be submitted examining the institutional, regulatory, and public education programs in place City-wide to reduce the generation of floatable litter. The report must also include recommendations for alternative City programs and an implementation schedule that will reduce the water quality impacts of street and toilet litter.

The Annual CSO BMP Report provides summary information regarding the status of the catch basin and booming, skimming, and netting programs City-wide. Also included is a thorough reporting of the public education, institutional and regulatory programs conducted by the City.

In response to NYSDEC questions, the CY2008 CSO BMP Annual Report, currently under NYSDEC review, used the updated 2008 catch basin database to provide a detailed accounting of basins in need of retrofitting or reconstruction. The city-wide total of 8,203 catch basins needing retrofit or reconstruction for hoods in 1999 has been reduced to 616 as of 2008. All of these basins require reconstruction. (NYCDEP, 2009). The number of catch basins requiring reconstruction in the Tallman Island WPCP drainage area is 42 with 22 of these located in the Alley Creek and Little Neck Bay watershed/sewershed. Based on these numbers, out of the total Alley Creek and Little Neck Bay catch basins, 3,549 (Tallman Island WPCP total is 13,465), the hooding coverage is 92 percent. This high percentage of hooding coverage is a result of NYCDEP's hood inspection and replacement program in accordance with its SPDES permits.

5.3.8 Sewer System Replacement

This BMP addresses NMC 1 (Proper Operations and Maintenance of Combined Sewer Systems and Combined Sewer Overflow Outfalls), requiring all combined sewer replacements to be approved by the NYSDOH and to be specified within the NYCDEP Master Plan for Sewage and Drainage. Whenever possible, separate sanitary and storm sewers should be used to replace combined sewers. The BMP Annual Report describes the general, City-wide plan and addresses specific projects occurring in the reporting year. No projects are reported for the Tallman Island WPCP service area in the Best Management Practices 2008 Annual Report.

5.3.9 Combined Sewer/Extension

In order to minimize storm water entering the combined sewer system, this BMP requires combined sewer extensions to be accomplished using separate sewers whenever possible. If separate sewers must be extended from combined sewers, analysis must occur to ensure that the sewage system and treatment plant are able to convey and treat the increased dry weather flows with minimal impact on receiving water quality.

This BMP addresses NMC 1 (Proper Operations and Maintenance of Combined Sewer Systems and Combined Sewer Overflow Outfalls) and a brief status report is provided in the Best Management Practices 2008 Annual Report, although no combined sewer extension projects were completed during that year.

5.3.10 Sewer Connection and Extension Prohibitions

This BMP addresses NMC 1 (Proper Operations and Maintenance of Combined Sewer Systems and Combined Sewer Overflow Outfalls) and prohibits sewer connections and extensions that would exacerbate recurrent instances of either sewer back-up or manhole overflows. Wastewater connections to the combined sewer system downstream of the last regulator or diversion chamber are also prohibited. The BMP Annual Report contains a brief status report for this BMP and provides details pertaining to chronic sewer back-up and manhole overflow notifications submitted to NYSDEC when necessary.

For the 2007 calendar year, no letter of notification was received from NYSDEC concerning chronic sewer backups or manhole overflows which would prohibit additional sewer connections or sewer extensions.

5.3.11 Septage and Hauled Waste

The discharge or release of septage or hauled waste upstream of a CSO (i.e., scavenger waste) is prohibited under this BMP. Scavenger wastes may only be discharged at designated manholes that never drain into a CSO, and only with a valid permit. This BMP addresses NMC 1 (Proper Operations and Maintenance of Combined Sewer Systems and Combined Sewer Overflow Outfalls). The 2008 CSO BMP Annual Report summarizes the three scavenger waste acceptance facilities controlled by NYCDEP and the regulations governing discharge of such material at the facilities. The facilities are located in the Hunts Point, Oakwood Beach and 26th Ward WPCP service areas. All of the designated manholes for receiving scavenger waste are downstream of CSO regulators.

5.3.12 Control of Runoff

This BMP addresses NMC 7 (Pollution Prevention Programs to Reduce Contaminants in CSOs) by requiring all sewer certifications for new development to follow NYCDEP rules and regulations, to be consistent with the NYCDEP Master Plan for Sewers and Drainage, and to be permitted by NYCDEP. This BMP ensures that only allowable flow is discharged into the combined or storm sewer system.

The 2008 CSO BMP Annual Report refers to the NYCDEP permit regulations required of new development and sewer connections.

5.3.13 Public Notification

This BMP requires easy-to-read identification signage to be placed at or near CSO outfalls with contact information for NYCDEP to allow the public to report observed dry weather overflows. All signage information and appearance must comply with the Discharge Notification Requirements listed in the SPDES permit. This BMP also requires that a system be in place to determine the nature and duration of an overflow event, and that potential users of the receiving waters are notified of any resulting, potentially harmful conditions. The BMP does allow NYCDOHMH to implement and manage the notification program. Accordingly, the Wet Weather Advisories, Pollution Advisories and Closures are tabulated for all NYC public and private beaches. The DMA Beach, a private beach on Little Neck Bay, was issued Wet Weather Advisories for 10 days, Pollution Advisories for 23 days and Beach Closure for 50 days during the 2007 bathing season.

BMP 13 addresses NMC 8 (Public Notification) as well as NMC 1 (Proper Operations and Maintenance of Combined Sewer Systems and Combined Sewer Overflow Outfalls) and NMC 9 (Monitoring to Characterize CSO Impacts and the Efficacy of CSO Controls). All of the Tallman Island CSOs have signs as summarized in the Best Management Practices 2007 Annual Report. The 2007 list of those former CSO outfalls that no longer require signs includes TI013, located on the East River which has been bulkheaded. NYCDEP is currently developing improvements to the CSO signs to increase their visibility and to include information relative to wet-weather warnings as required by the USEPA CSO Policy. In addition, descriptions of new educational signage and public education-related partnerships are described. The New York City Department of Health CSO public notification program is also summarized.

5.3.14 Annual Report

This BMP requires that an annual report summarizing implementation of the BMPs, including lists of all existing documentation of implementation of the BMPs, be submitted by April 1st of each year. This BMP addresses all nine minimum controls. As of June 2009, the most recent CSO BMP Annual Report submitted covers calendar year 2008.

5.4 CITY-WIDE CSO PLAN FOR FLOATABLES ABATEMENT

NYCDEP developed a floatables abatement plan for the CSO areas of New York City in June 1997. An update of the Comprehensive Plan was subsequently drafted in 2004 and further modified in 2005 (City-Wide Comprehensive CSO Floatables Plan, Modified Facility Planning Report, July 2005) to reflect the completion of some proposed action elements, as well as changes appurtenant to SPDES permits and modifications of regional Waterbody/Watershed Facility Plans and CSO Facility Plans. The objectives of this plan are to provide substantial reductions in floatables discharges from CSOs throughout the City and to provide for compliance with appropriate NYSDEC and IEC requirements pertaining to floatables.

5.4.1 Program Description

The City-Wide CSO Floatables Abatement Plan consists of the following action elements:

- Monitor city-wide street litter levels and inform New York City Department of Sanitation (DSNY) and/or the New York City Mayor's Office of Operations when changes in litter levels are observed or when City policies would potentially result in increased discharges of CSO floatables;
- Continue the three-year cycle to inspect catch basins city-wide for missing hoods and to replace missing hoods to prevent floatables from entering the sewer system. In addition, proceed with the retrofit, repair, or reconstruction of catch basins requiring extensive repairs or reconstruction to accommodate a hood;
- Maximize collection system storage and capacity;
- Maximize wet-weather flow capture at WPCPs;
- Capture floatables at wet-weather CSO storage/treatment facilities;
- Capture floatables at end-of-pipe and in-water facilities, including the Interim Floatables Containment Program (IFCP);
- Continue the Illegal Dumping Notification Program (IDNP) in which NYCDEP field personnel report any observed evidence of illegal shoreline dumping to the Sanitation Police section of DSNY, who have the authority to arrest dumpers who, if convicted, are responsible for proper disposal of the material;
- Engage in public outreach programs to increase public awareness of the consequences of littering and the importance of conserving water;
- As new floatables-control technologies emerge, continue to investigate their applicability, performance and cost-effectiveness in New York City; and
- Conduct a floatables-monitoring program to track floatables levels in the Harbor and address both short- and long-term floatables control requirements.

The Floatables Plan is a living program that will undergo various changes over time in response to ongoing assessment of the program itself as well as changing facility plans associated with other ongoing programs. A key part of the Floatables Plan is a self-assessment component including a new floatables-monitoring program to evaluate the effectiveness of Plan elements and to provide for actions to address both short- and long-term floatables control requirements (see Section 8.5.3). Evidence of increasing floatables levels that impede uses could require the addition of new floatables controls, expansion of BMPs, and modifications of Waterbody/Watershed Facility Plans and/or drainage-basin specific LTCPs, as appropriate. Overall, the Comprehensive Plan is expected to control approximately 96 percent of the floatable street litter generated in New York City.

5.4.2 Pilot Floatables Monitoring Program

In late 2006, work commenced to develop the Floatables-Monitoring Program to track floatables levels in New York Harbor (HydroQual, 2007a). This pilot work which was performed to develop a monitoring procedure and an associated visual floatables rating system

based on a five-point scale (very poor, poor, fair, good, very good), involved observations at a number of different sites. At each site, observations were made for up to three categories: on the shoreline, in the water near the shoreline; and in the water away from the shoreline.

Among the various pilot program sites were two locations in the Alley Creek and Little Neck Bay area: one in Douglaston at the DMA Beach on Little Neck Bay (New York City Beach Survey station BS14) and one near the mouth of Alley Creek (New York City Beach Survey station BS34). By August of 2007, a total of 19 observations were recorded for the open water, near shore water and shoreline at these three locations. The scores from the reported observations at the DMA Beach station were consistently good (25%) to very good (75%) for both of the water locations and shoreline. The Alley Creek station observations were more variable. The open water rated very good (30%) and good (70%). The near shore water rated very good (25%), good (50%) and fair (25%). The shoreline rated good (20%), fair (70%) and poor (10%).

5.4.3 Shoreline Cleanup Program

As part of the Environmental Benefit Program (EBP) established under the Long Island Sound (LIS) Nitrogen Consent Judgment, the NYCDEP has implemented a beach cleanup program to improve shorelines at locations where floatables are known to chronically accumulate due to CSO overflows as well as careless behaviors and illegal dumping. This Nitrogen EBP project, was undertaken in connection with the settlement of an enforcement action taken by New York State and NYSDEC for violations of New York State law and NYSDEC regulations. NYCDEP existing floatables collection program addresses CSO and storm outfalls, which have boom and netting containment facilities. This project addresses CSO and storm outfall locations which do not have containment facilities and based on inspection, warrant a manual clean up effort to remove near-shore floatables and trash on an as-needed basis throughout the year. NYCDEP has identified several specific areas as examples of areas that may benefit from these efforts including

- Coney Island Creek, Brooklyn
- Kaiser Park, Brooklyn
- Sheepshead Bay, Brooklyn
- Cryders Lane, Queens
- Flushing Bay, Queens and
- Owls Head, Brooklyn.

These cleanup efforts consist of three primary methods.

- Mechanical cleanup -Where debris is caught up in riprap on the shoreline, a high-pressure pump is used to spray water onto the shoreline to dislodge the debris and floatables and flush them out of the rip-rap back into the water. Once in the water, a skimmer vessel gathers the debris. A containment boom is placed in the water surrounding the skimmer vessel and the riprap area being cleaned to hold the debris for removal by the skimmer vessel.
- Workboat assisted cleanup – At a few locations where the shoreline is not readily accessible from the landside, a small workboat with an operator and two crewmembers

collect debris by hand or with nets and other tools. The debris is placed onto the workboat for transport to a skimmer boat for ultimate disposal.

- Manual cleanup- At some locations simple raking and hand cleaning is the cleanup method of choice. Debris is removed and placed into plastic garbage bags or containers and transported in a pickup truck for disposal.

NYCDEP is currently planning on performing three cleanups each year for a four-year period at each of the above locations. Pending the outcome of this program, as well as the findings of the floatables monitoring program, an evaluation will be made of how NYCDEP will proceed in the future. None of the sites for the Nitrogen EBP Shoreline Cleanup Program is in the Alley Creek and Little Neck Bay area.

5.5 LONG-TERM CSO CONTROL PLANNING

In June 2004 NYCDEP authorized the LTCP Project. This work will integrate all Track 1 and Track II CSO Facility Planning Projects and the Comprehensive City-wide Floatables Abatement Plan, incorporating on-going USA Project work in the remaining waterbodies, and developing Watershed/Waterbody Facility Plan reports and the LTCP for each waterbody area. The LTCP Project monitors and assures compliance with applicable Administrative Consent Orders. The present document is a work product of the LTCP Project.

5.6 EVALUATION OF CSO TECHNOLOGIES

NYCDEP also has a demonstrated commitment to evaluating state-of-the-art alternatives that have the potential to provide cost-effective solutions with maximum water quality benefits. The Corona Avenue Vortex Facility has been constructed in the Corona section of Queens to evaluate the effectiveness of three different vortex technologies for settleable solids and floatables removal. NYCDEP has installed inflatable dams in the Soundview section of the Bronx for the purpose of demonstrating this technology for real time control and in-line storage. The NYCDEP is also investigating supplemental aeration in Newtown Creek as a method of improving dissolved oxygen conditions. At the time of the writing of this report, Shellbank Basin Destratification Facility is in operation, a facility designed to enhance water quality through destabilizing water column stratification. The NYCDEP has been in the forefront of abating floatables discharges by conducting several floatables investigations, pilot testing floatables controls, and implementing control programs in catch basins, sewer systems, at the ends of pipes, and in receiving waters.

5.7 ALLEY CREEK CSO RETENTION FACILITY (EXISTING CSO FACILITY PLAN)

In 1984 the NYCDEP initiated the East River Combined Sewer Overflow (ERCSO) Facilities Planning Project to address CSO abatement in one of the four principal CSO planning areas that was defined in the 208 Study. The ERCSO project was to increase, to an extent reasonably feasible and practical, compliance with NYSDEC water quality standards in the East River and its principal tributaries, including Alley Creek and Little Neck Bay. This study included a series of field investigations, modeling of both the landside and receiving water processes, and development of abatement alternatives. This planning process resulted in a recommendation for construction of a 5 MG capacity retention facility and construction of a new

outfall to abate flows from the largest contributing CSO outfall to Alley Creek, TI-008, which is located approximately 0.4 miles upstream from the outlet of Alley Creek into Little Neck Bay (URS, 2003).

The 5 MG Alley Creek CSO Retention Facility is designed to store and capture combined sewage and pass up to a peak design flow of approximately 1,980 cfs or 1,300 MGD. The new CSO outfall sewer and CSO retention facility have been designed to operate passively during wet weather events. CSO volumes in excess of the storage capacity of the conduit (5 MG) will overflow the crest of a 120 ft long fixed weir at the terminus of the new outfall sewer and discharge to Alley Creek through the new outfall, TI-025. The retention facility receives CSO flows from Chamber No. 6, a new facility located near the intersection of 223rd St. and Cloverdale Boulevard. It will receive the flows from Regulator Nos. 46, 47, 49, and Chamber 48. Chamber 6 is designed with a weir to divert all of the flow to the new retention facility that currently discharges from the existing 10 ft by 7.5 ft CSO Outfall TI-008. During storms which exceed a five-year return period as defined by NYCDEP, the portion of the CSO flow that exceeds the 1,300 MGD hydraulic capacity of the new CSO retention facility and the new TI-025 outfall sewer will overflow a fixed weir at Chamber No. 6 and be conveyed through the existing sewer and discharge through CSO Outfall TI-008.

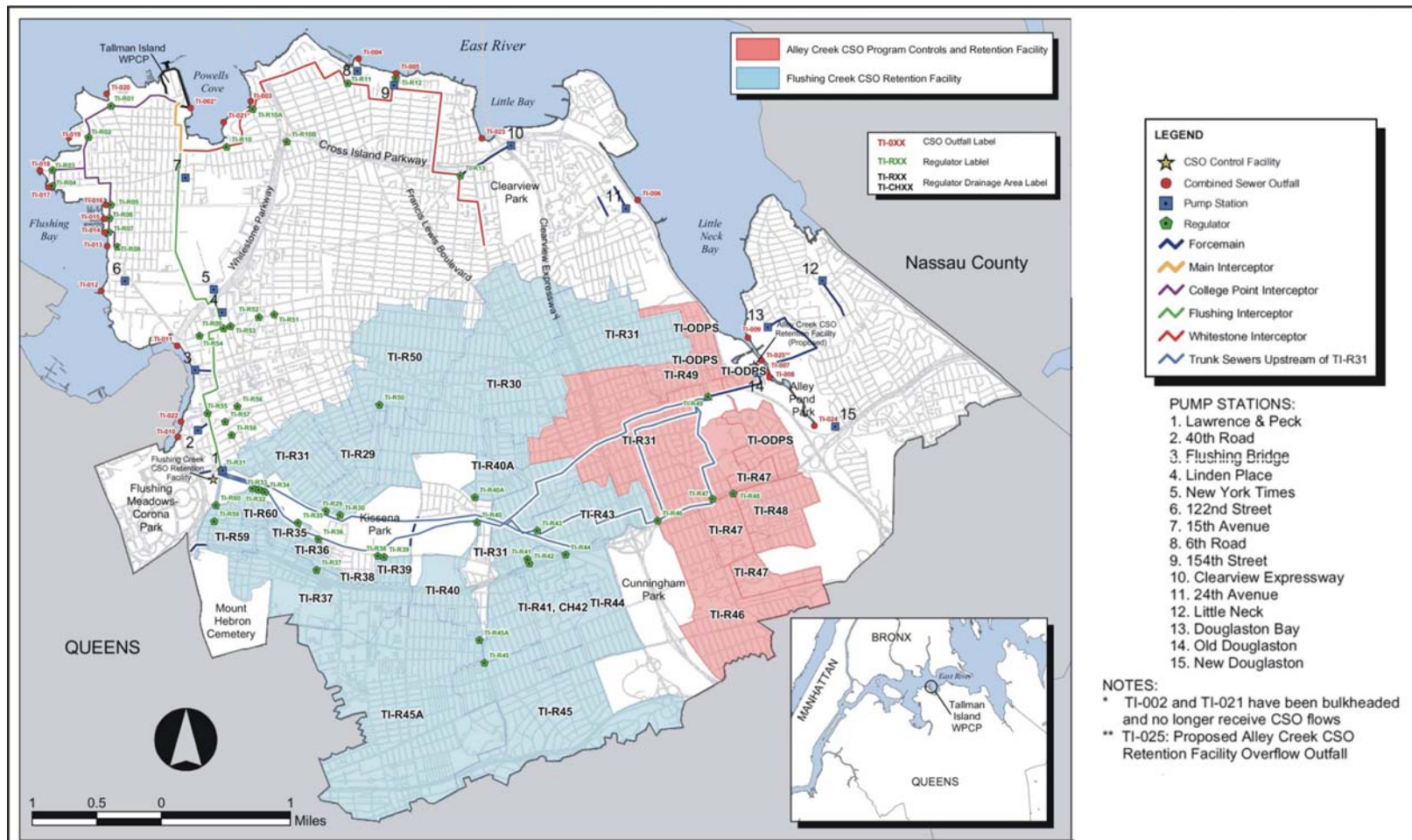
The Alley Creek CSO retention facility is being implemented by NYCDEP as one element in a larger phased project to provide drainage relief and CSO abatement for sewer service areas on the west side of Alley Creek. The location of the drainage areas that are part of the project, and the location of the retention facility are shown in Figure 5-1. The project is being implemented in multiple contracts under the following phases.

- Phase I, Stage 1 – Alley Creek Drainage Area Improvements - This stage of the project provides drainage relief through the construction of a number of storm and combined sewer relief lines at various locations shown in Figure 5-2. Most relevant to the CSO abatement is the construction of a new outfall conduit and storage facility to which will divert most of the stormwater and CSO flows that had been previously discharged through Outfall TI-008.

These drainage improvements have been constructed under Contract ER-AC1. Cost apportionment under this contract have been estimated at approximately \$100,000,000 for general sewer system improvements and for CSO abatement. These costs include change orders experienced on the project through late 2006. Drainage elements and CSO facility elements are summarized as follows:

Drainage and CSO Facility Elements

1. Approximately 1,200 feet of a 11'-0" W x 9'-0" H combined sewer and chambers constructed parallel to the existing 6'-0" W x 8'-0" H combined sewer along 46th Avenue between Springfield Boulevard and 223rd Street.
2. Approximately 1,400 feet of a 11'-0" W x 8'-0" H combined sewer and chambers constructed along Springfield Boulevard between 51st Avenue and 47th Avenue to replace an existing 66-inch diameter combined sewer.

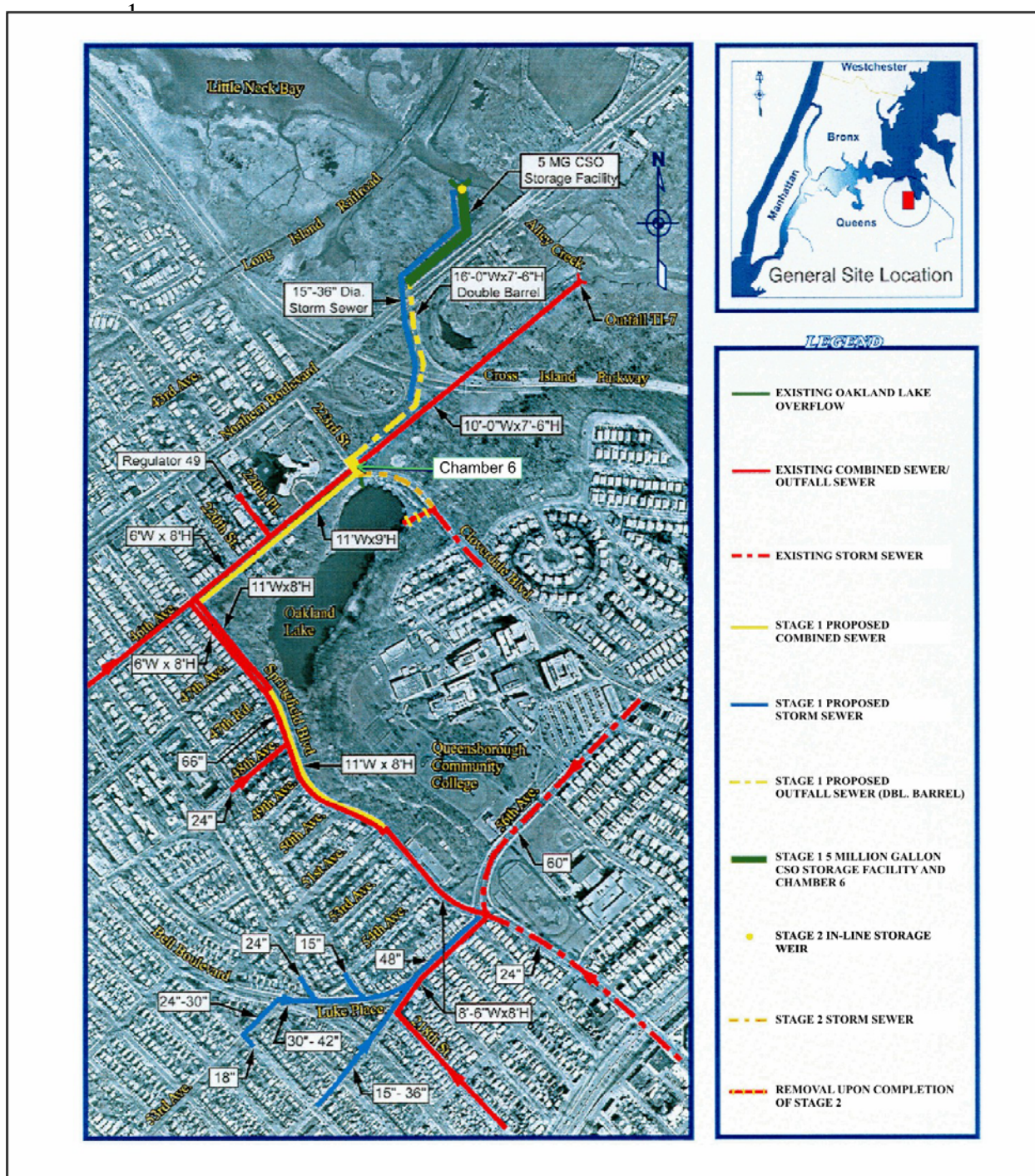


New York City
Department of Environmental Protection

Alley Creek and Little Neck Bay Waterbody/Watershed Facility Plan

Flushing Creek and Alley Creek Drainage Areas and CSO Program Controls

FIGURE 5-1



New York City
Department of Environmental Protection

Alley Creek and Little Neck Bay Waterbody/Watershed Facility Plan

Alley Creek CSO Retention Facility Stage 1 and Stage 2 Construction

FIGURE 5-2

3. Approximately 3,000 feet of storm sewers varying in diameter from 15 inches through 48 inches and manholes installed along reaches of 53rd Avenue, 56th Avenue, 214th Street, 216th Street, 217th Street, Bell Boulevard, and Luke Place.
 4. Approximately 1,700 feet of new storm sewer, located along the north side of the new outfall sewer, ranging in diameter from 15 to 36 inches to serve the Cross Island Parkway catch basins located north of the new outfall sewer.
 5. New catch basins installed along Springfield Boulevard, 46th Avenue, 53rd Avenue, 56th Avenue, 214th Street, 216th Street, 217th Street, Bell Boulevard, Luke Place, Northern Boulevard, and the Cross Island Parkway.

A multi-barrel outfall sewer and chambers constructed from near the intersection of 47th Avenue and 223rd Street, extending easterly/northeasterly across Alley Park to the new outfall on Alley Creek; this outfall sewer begins as a double barrel (each barrel 16'-0" W x 7'-6" H) sewer and extends approximately 1,475 feet to a point on the north side of Northern Boulevard where the outfall sewer increases to a double barrel (each barrel 20'-0" W x 7'-9" H) sewer extending approximately 650 feet to the outfall on Alley Creek.
 6. A CSO storage facility to be located north of Northern Boulevard along both sides of the 20'-0" W by 7'-9" H (average height) double barrel outfall sewer, with approximate dimensions of 120 feet wide by 600 feet long, with depths ranging from approximately 9 to 12 feet. During Phase I, Stage I, temporary bulkheads will be constructed on the side overflow weir walls between the outfall conduit and storage tanks.
 7. A 24-inch diameter gravity drain for the outfall sewer and a 36-inch diameter gravity drain for the CSO storage facility, extending from the 20'-0" W x 7'-9" H (average height) double barrel outfall sewer and CSO storage facility, respectively, to the Old Douglaston Pumping Station, and crossing under Northern Boulevard.
 8. Approximately 2,350 feet of a 20-inch diameter force main extending generally along the south side of the new outfall sewer/CSO storage facility from the Old Douglaston Pumping Station to the general vicinity of the intersection of 46th Avenue and 223rd Street; the new force main replaces a section of an existing 20-inch diameter force main.
 9. An outfall structure with tide gates located on Alley Creek at the downstream end of the 20'-0" W x 7'-9" H (average height) double barrel outfall sewer and CSO storage facility, including scour protection measures to prevent scouring of the creek bed and restoration of the disturbed creek bed with riprap.
- Phase I, Stage 2 – Alley Creek CSO Abatement Facilities – Construction of these elements needed for activation of the wet weather flow storage facility is being accomplished under contract ER-AC2. Construction has been initiated at approximately \$30,000,000 for general sewer system improvements and for CSO abatement. Work will include:

1. Modifications to the Old Douglaston Pumping Station to transfer captured combined sewage from the 5 MG storage facility to the Tallman Island WPCP for treatment. The capacity of the pumping station is sufficient for this transfer of stored combined sewage; however, a full upgrade of the station will be included in the project to increase the station's reliability. The upgrade will include the air treatment facilities as described below, replacement of all pumps, new controls, improvements to the electrical and HVAC systems, and installation of new instrumentation and telemetry. The CSO outfall TI-007, the Old Douglaston PS emergency bypass, is being demolished as per NYSDEC mandate. Collection System Operations will monitor from the telemetry system and respond to any alarms.
2. An air treatment system installed within the fence line at the Old Douglaston Pumping Station to treat exhaust air from the CSO storage facility and the wet well of the pumping station. The air treatment system will reduce hydrogen sulfide concentrations in the inlet air to at least 1 parts per billion (ppb) at the nearest sensitive receptor, the Alley Pond Environmental Center. This criterion satisfies the NYCDEP's air quality requirements.
3. A fixed weir constructed within the new outfall sewer TI-025 at the downstream end to induce storage of combined sewage in the storage facility during rain events.
4. A baffle constructed within the outfall sewer immediately upstream of the fixed weir to minimize floatables from entering Alley Creek.
5. Ten (10) Hydrosel Flushing Gates installed within the CSO storage facility with five (5) gates located at each end of the facility. These gates will be used to flush the storage facility after each rain event.
6. Activation of the storage facility by removal of knockout blocks installed under Stage 1.

The overflow weir from the conveyance/storage sewer will be equipped with a baffle to hold back some of the floatables from overflow discharge, but the facility will be equipped with no other treatment processes for reducing the concentration of contaminants in the overflow and no specific treatment levels are envisioned (NYCDEP, 2003). The city's permit application for the facility specifically addresses the question of disinfection of facility overflow discharge. The Facility Plan notes that space could be provided for sodium hypochlorite disinfection equipment; however, disinfection is not recommended based on the following issues:

- chlorine demand that varies randomly within the events, and the large volumes and application rates of chlorine that would be required,
- the need to de-chlorinate and the inability to meet NYSDEC receiving water residual chlorine water quality standards,
- the unknown implications of future TMDL requirements, and

- the effectiveness of disinfecting the retention facility effluent in the presence of untreated and un-disinfected CSOs which will enter Alley Creek.

On balance it was judged that effective control of the chlorine residual discharge to the environment would be very difficult, and that the likely adverse ecological impacts associated with high chlorine residuals or depleted oxygen content from excessive addition of dechlorination chemicals would outweigh the desired public health objectives.

- Phase I, Stage 3 – Alley Pond Park Environmental Restoration – As mitigation for the disturbance due to the construction activities, permanent environmental restoration of approximately 23.5 acres within the Park will be performed under Contract ER-AC3, Alley Pond Park Environmental Restoration. This environmental restoration will take place on both the northern and southern sides of Northern Boulevard, east of 223rd Street. A location map of the restoration is shown in Figure 5-3.

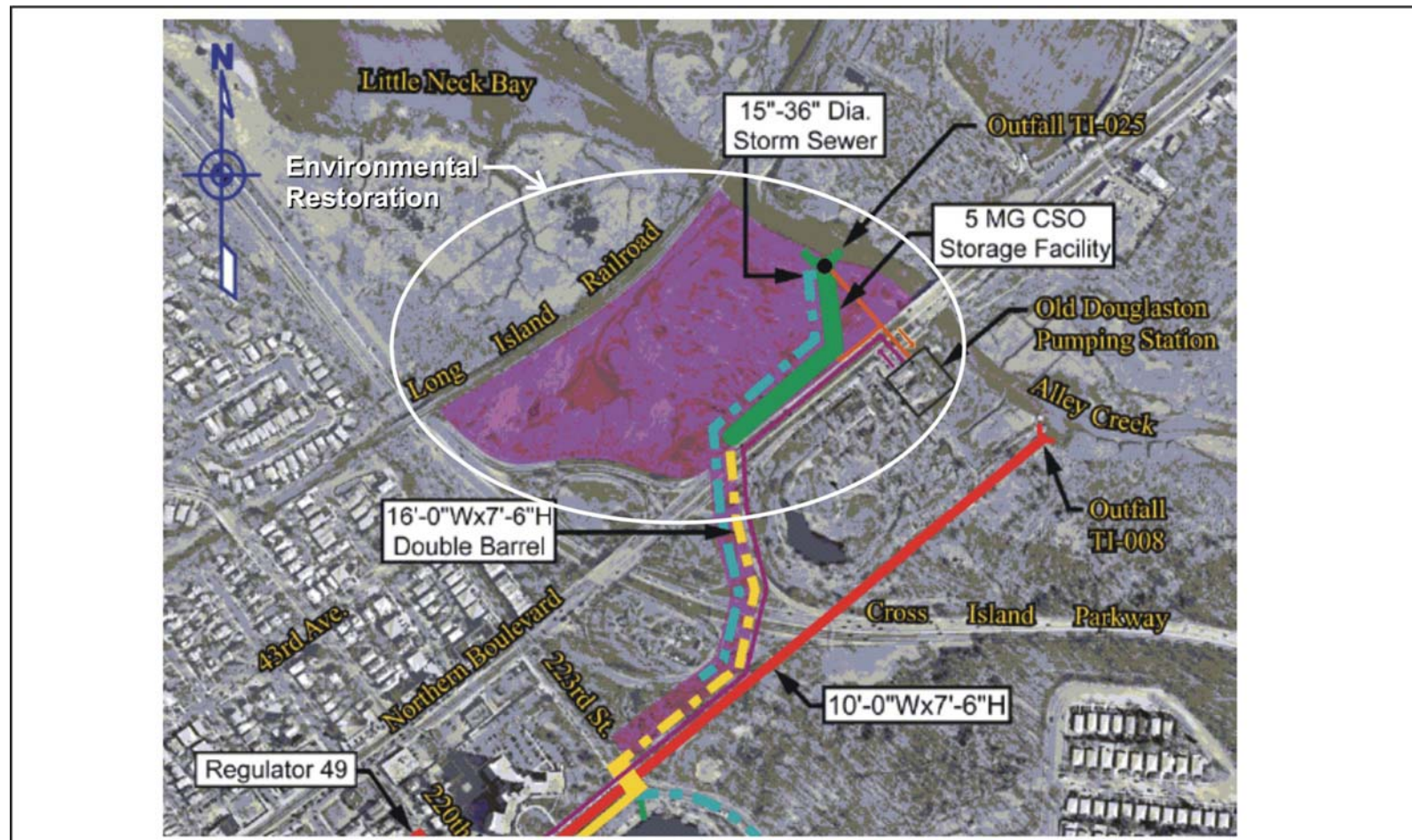
On the north side of Northern Boulevard, the restored area consists of approximately 17.2 acres, and is bounded by the boulevard to the south, Alley Creek to the east, Long Island Railroad to the north, and Cross Island Parkway to the west. The restoration in this northern area includes restoring existing/creating new wetlands (salt marsh), totaling approximately 8.2 acres, consisting of approximately 0.9 acre of open water and 7.3 acres of low marsh planted primarily with *Spartina Alterniflora*. The remaining 9 acres of restoration in this northern area consists of providing 8 acres of an upland/parkland community planted with a wildflower mixture, trees, shrubs and herbaceous plants native to the area, and 1 acre of a paver block roadway planted with native grasses. This roadway is needed for NYCDEP personnel to access the outfall sewer, storage facility and outfall structure for maintenance purposes.

The area of restoration on the south side of Northern Boulevard consists of approximately 6.3 acres along the route of the double barrel outfall sewer between 223rd Street to the west and the boulevard to the east. In this southern area, restoration consists of providing 5.9 acres of an upland/parkland community planted with trees, shrubs and herbaceous plants native to the area, and 0.4 acre of a paver block roadway planted with native grasses. This project is not a CSO abatement project.

- Phase II – Oakland Ravine Stormwater – A wetlands stormwater treatment system is planned to manage stormwater flows from the Oakland Ravine. This flow will then be routed to Oakland Lake, and from there to Alley Creek via Outfall TI-008. This project is not a CSO abatement project.

5.8 NEW YORK CITY SUSTAINABILITY INITIATIVES

Sustainable stormwater management usually involves replicating the natural water balance and stormwater dynamics through the design of natural ecological processes and functions, and controlling stormwater at the source. The technologies that serve this goal are referred to as stormwater best management practices (BMPs), and include a wide range of techniques that can capture stormwater, remove urban pollutants, reduce runoff volumes and



New York City
Department of Environmental Protection

Alley Creek and Little Neck Bay Waterbody/Watershed Facility Plan

General Location of Alley Park Environmental Restoration

FIGURE 5-3

peak flows, and return stormwater to the landscape and subsurface in a manner beneficial to the environment (see Section 7.3.2). Low-impact development (LID) refers to the land use approach that integrates various stormwater management practices in an attempt to minimize the changes to the natural environment that the built environment has, and has alternately been referred to as Green Site Design (GSD) or more generically as simply “green solutions.” Distributive by design, stormwater BMPs must be applied over a large area in order to achieve significant runoff attenuation. In densely developed ultra-urban cities such as New York City, it is easiest to incorporate green solutions into redevelopment and new construction.

Green solutions, including various BMPs and feasible implementation strategies, are currently being evaluated through the NYCDEP Bureau of Environmental Planning and Assessment and the Mayor's Office of Long-Term Planning and Sustainability. The Mayor's Office established the BMP Interagency Task Force to incorporate BMPs into the design and construction of projects as part of PlaNYC 2030. The Interagency Task Force assisted the development of the Sustainable Stormwater Management Plan, a comprehensive analysis of the costs and benefits of source controls, which was submitted to City Council in December 2008 per Local Law 5. NYCDEP participated in the Interagency Task Force and substantially supported the development of the Stormwater Management Plan. NYCDEP is also evaluating regulatory changes that could require BMPs for new development, and will have a contractor on board in 2009 to design and construct BMP pilot projects, evaluate watershed specific BMP effects, and develop a New York City specific urban BMP design manual (see Section 5.8.2). The following subsections detail these and other stormwater management initiatives the City has recently undertaken. Although several initiatives explicitly identify specific areas for targeted pilot programs, the remaining projects have broad implications within the Alley Creek and Little Neck Bay watershed as the City continues to refine its policies and practices pertaining to stormwater management.

5.8.1 Jamaica Bay Watershed Protection Plan (JBWPP)

On June 30, 2005, the New York City Council passed Local Law 71 (LL 71) of 2005 to require the development of a watershed protection plan for Jamaica Bay. The legislation required NYCDEP to “assess the technical, legal, environmental and economical feasibility” of a variety of protection measures as part of the Jamaica Bay Watershed Protection Plan (JBWPP) development process, the objective of which is to restore and maintain the water quality and ecological integrity of the Bay through a comprehensive watershed approach. The Final JBWPP was submitted to the City Council on October 1, 2007, and annual JBWPP updates are expected in October of 2008 and 2010.

The JBWPP included a myriad of ecological restoration and water quality improvement strategies, and new and emerging techniques previously unaddressed, such as stream bank protection, stream buffers, other BMPs, enforcement, access and use restrictions, freshwater ponds, urban runoff management, and expansion of community use and participation. A set of recommendations for restoring and protecting desired uses of Jamaica Bay and its watershed were generated. Collectively, these pilot studies, regulatory initiatives, public outreach efforts, and technical innovations will begin to address water quality and ecological issues facing Jamaica Bay, promoting sustainability in New York City based on sound development and infrastructure practices at multiple levels. Many of the recommendations in the JBWPP are outside NYCDEP's authority or mission, and NYCDEP's support for these projects must be

considered in the context of other agency mandates. The financial plan for the Bay has not been fully developed.

The first JBWPP update was submitted to City Council in October 2008 and included status reports on the implementation of many strategies identified in the JBWPP and the status information presented below for stormwater BMPs.

5.8.2 BMP Pilots, Design Manual and Watershed Planning

Following the development of the JBWPP, NYCDEP developed a contract to implement BMP strategies throughout the City. A significant portion of the contract, which commenced in April 2009, includes multiple stormwater BMP pilot projects that will be used to evaluate the efficacy of each BMP, maintenance needs, schedules, and uncertainties associated New York City-specific climate and site conditions (local geology, cold weather limitations, construction costs, maintenance requirements, etc.). The results of these pilots will be used to guide future development practices, and the development of a BMP design manual and watershed planning analyses. The specific pilots in the contract included:

- Three locations in the Bronx at which stormwater BMP retrofits for open space and other land uses will be evaluated;
- New York City Housing Authority (NYCHA) complexes will test the ability to redirect runoff to existing pervious surfaces and encourage on-site stormwater infiltration;
- A porous pavement pilot to investigate different types of porous pavement and potential maintenance issues associated with the use of porous pavement;
- Two locations in southeast Queens along North and South Conduit Avenues that will be used to quantify the benefits of tree plantings and other BMPs for stormwater management;
- Two 10,000 square-foot, publicly owned rooftops will be retrofitted with blue roofs to evaluate retrofitting existing structures;
- The distribution of 1,000 55-gallon capacity rain barrels to gauge public acceptance of and interest in this technology, with focused distribution in the Jamaica Bay watershed (250 of which were distributed during the spring and summer of 2007).

The BMP Design Manual to be developed under the same contract, will provide specific guidance for designing and constructing BMPs, based on New York City conditions and the regulatory environment. The BMP Design Manual will identify specifically how to design and install effective BMPs in New York City, addressing different land use and building classifications, local climate conditions, and the regulatory environment. The manual will include the pilot and demonstration projects as examples and is anticipated to have an online, interactive access portal that can be used to tailor a stormwater control to specific site conditions.

Another noteworthy component of the contract is the development of watershed plans for up to four watersheds that will be based on a comprehensive water quality and ecological

approach. These watershed plans will identify BMP, restoration, and other low impact/decentralized strategies for addressing multiple water quality and ecosystem goals. As of the date of this report, the four watersheds are the Bronx River, Flushing Bay and Creek, Gowanus Canal, and Newtown Creek; however, this list is subject to modification as new information arises and priorities evolve.

5.8.3 PlaNYC 2030

On Earth Day in 2007, Mayor Bloomberg announced a comprehensive City-wide set of initiatives focused on environmental stewardship called PlaNYC 2030. By dividing the urban environment into its fundamental components (land, water, transportation, energy, and air), PlaNYC enabled New York City to identify and execute actions that would lead to a more sustainable city. PlaNYC identified specific initiatives to promote BMP implementation, including the formation of an interagency BMP Task Force, development of pilot projects for promising BMPs, and providing incentives for green roofs. The BMP Interagency Task Force met regularly during 2007 and 2008 to discuss feasible mechanisms for distributed stormwater control through the design and construction of different agency projects within the City's right of-way, open space, and public and private developments. The Task Force held several public meetings to receive the input of diverse stakeholders citywide. The pilot projects identified in PlaNYC (e.g., improved tree pit design and roadway vegetated swales) will be implemented by NYCDEP along with other stormwater BMP pilot projects as part of several contracts described below. Finally, the State Legislature recently approved a green roof tax abatement program (Bill Number A11226) to encourage construction and maintenance of green roofs in the City. The amount of the abatement would be \$4.50 per square foot of green roof, limited to the lesser of \$100,000 or the buildings tax liability for the year in which the abatement is taken. The bill was officially written as law in fall 2008 and with a sunset date of March 15, 2013.

5.8.4 Sustainable Stormwater Management Plan

The City Council passed Local Law 5 in 2008 requiring the Mayor's Office of Long-Term Planning and Sustainability to develop a City-wide Sustainable Stormwater Management Plan, the goals of which are to reduce stormwater volume, improve water quality, and enhance the use and enjoyment of the city's waterbodies for recreational activities. The specific requirements of the plan focus on defining cost-effective stormwater management measures, for different types of properties or areas in the city, along with a prioritization of measures and timeline for implementation. A substantial public participation and public education program obtained public input during the development of the plan. Specific requirements for signage, public notification for location and occurrence of CSOs, and other education activities are also included. The draft plan was issued as required on October 1, 2008 to the mayor, speaker of the council, and the public; the final was issued December 1, 2008. The Plan provides a framework for testing, assessing, and implementing pilot installations to control stormwater at its source, as well as strategies to supplement existing stormwater control efforts, develop innovative and cost effective source controls, and secure funding for future implementation. NYCDEP lent substantial support to the development of the Plan. The law expects a four-year review cycle, with reports every other October beginning in 2010.

5.8.5 NYCDEP Environmental Benefit Projects

In connection with the settlement of an enforcement action taken by New York State and DEC for violations of New York State law and DEC regulations, NYCDEP submitted a Nitrogen Consent Judgment Environmental Benefit Project (EBP) Plan to NYSDEC in January 2007 that proposed a stormwater pilot study in the Jamaica Bay drainage area. This project will use Nitrogen Consent Judgment EBP funds to conduct a three year pilot study program to implement and monitor several stormwater treatment technologies and volume reduction stormwater BMPs for potential application within the Jamaica Bay watershed. The goals of Jamaica Bay Watershed Stormwater Pilot Project include documenting the quality of New York City stormwater and refining the specific capture rates and treatment efficiencies that may be expected locally. Once this information has been gathered, effective Green Site Design stormwater strategies would be developed for potential future applications.

The project is expected to cost approximately \$1.75 million and will include infiltration swales for street-side and parking lot applications, parking lot curb water capture systems, enhanced tree pits, and a commercial green roof / blue roof comparison installation. The EBP is being conducted through an innovative collaborative effort between NYCDEP and the Gaia Institute. NYCDEP entered into a contract with the Gaia Institute to complete the pilot study. The Gaia Institute is a 501(c)3 not-for-profit corporation located on City Island in the Bronx that explores how human activities can be attenuated to increase ecological productivity, biodiversity, environmental quality, and economic well being.

In connection with the settlement of an enforcement action taken by New York State and DEC for violations of New York State law and DEC regulations, NYCDEP also submitted a CSO EBP Plan for NYSDEC approval in March 2008 that is expected to partially reduce the rate and volume of stormwater that enters the combined sewer system through stormwater BMP implementation in select drainage areas. Practices such as bioinfiltration swales, enlarged street tree pits with underground water storage, constructed wetlands, and others would be evaluated. The CSO EBP Plan proposes pilots in the Bronx, Flushing, and Gowanus watersheds which were selected in part to be representative of the range of watersheds encountered in New York City so that pilot results may be applied Citywide. NYSDEC approved the EBP Plan in April 2008.

5.8.6 BMP Code Review Task Force

A detailed review of New York City's existing codes and regulations is being performed in an attempt to identify potential code revisions that could be recommended to promote BMP implementation. NYCDEP convened various staff from different bureaus and offices within the agency (Bureaus of Environmental Planning and Analysis, Water and Sewer Operations, Legal Affairs, and the Office of Strategic Projects) and other City agencies (Department of Buildings, Law Department and Mayor's Office of Long-Term Planning and Sustainability) to conduct the review. The Task Force identified opportunities for revisions that would encourage BMP installation based on a review of BMP regulations and practices in other urban municipalities such as Portland, Philadelphia, Chicago, and Seattle. As described in the Mayor's Sustainable Stormwater Management Plan, new stormwater requirements are anticipated by the end of 2009.